

## ***Superstructure Element Index***

101 -4- Steel - Closed Web/Box Girder - Unpainted  
102 -5- Steel - Closed Web/Box Girder - Painted  
104 -4- P/S Concrete - Closed Web/Box Girder  
105 -4- Concrete - Closed Webs/Box Girder  
106 -4- Steel - Open Girder - Unpainted  
107 -5- Steel - Open Girder - Painted  
109 -4- P/S Concrete - Open Girder  
110 -4- Concrete - Open Girder  
111 -4- Timber - Open Girder  
112 -4- Steel - Stringer - Unpainted  
113 -5- Steel - Stringer - Painted  
115 -4- P/S Concrete - Stringer  
116 -4- Concrete - Stringer  
117 -4- Timber - Stringer  
120 -4- Steel - Bottom chord Through Truss - Unpainted  
121 -5- Steel - Bottom chord Through Truss - Painted  
125 -4- Steel - Through Truss excluding Bottom Chord - Unpainted  
126 -5- Steel - Through Truss excluding Bottom Chord - Painted  
130 -4- Steel - Deck Truss - Unpainted  
131 -5- Steel - Deck Truss - Painted  
135 -4- Timber - Truss/Arch  
140 -4- Steel - Arch - Unpainted  
141 -5- Steel - Arch - Painted  
143 -4- P/S Concrete - Arch  
144 -4- Concrete - Arch  
145 -4- Arch - Other/Stone Masonry  
146 -4- Steel - Cable not embedded in concrete (Uncoated)  
147 -5- Steel - Cable not embedded in concrete (Coated)  
151 -4- Steel - Floor Beam - Unpainted  
152 -5- Steel - Floor Beam - Painted  
154\*-4- P/S Concrete - Floor Beam  
155 -4- Concrete - Floor Beam  
156 -4- Timber - Floor Beam  
160 -4- Steel - Pin and Hanger Assembly - Unpainted  
161 -5- Steel - Pin and Hanger Assembly - Painted

The following SmartFlags may be used in conjunction with Superstructure elements:

355\*-3- Steel Diaphragms  
356 -3- Steel - Fatigue  
357 -4- Pack Rust (Superstructure)  
362 -3- Traffic Impact (Superstructure)

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Units: LF of Girder

This element defines only those steel closed web/box girder units that are not painted or are constructed of weathering steel. Report the estimated lineal feet in each of Condition States 2 through 4. The number of units in Condition State 1 will be the remainder of the units after deducting those reported in Condition States 2 through 4.

CDOT SUGGESTED CONDITION STATES FOR CORROSION ON UNPAINTED STEEL ELEMENTS		
	Description	CS
R1	Pitting or surface rust, etc. No measurable section loss	2
R2	Flaking, minor section loss ( $\leq 10\%$ thickness loss)	3
R3	Flaking, swelling, mod. section loss ( $10\% < \text{thickness loss} \leq 30\%$ ) <b>structural analysis is not warranted.</b>	3
R3	Flaking, swelling, mod. section loss ( $10\% < \text{thickness loss} \leq 30\%$ ) <b>structural analysis is warranted due to location of corrosion on the member.</b>	4
R4	Heavy section loss ( $> 30\%$ thickness loss), may have holes through base metal.	4

Condition State 1 **There is little or no corrosion** of the unpainted steel. The weathering steel is coating uniformly and remains in excellent condition.

Feasible actions: 1) DN

Condition State 2 **Surface rust, surface pitting, has formed or is forming** on the unpainted steel. The weathering steel has not corroded beyond design limits. Weathering steel color is yellow orange to light brown.

Feasible actions: 1) DN  
2) Clean & paint

Condition State 3 **Steel has measurable section loss due to corrosion but does not warrant structural analysis.** Weathering steel is dark brown or black.

Feasible actions: 1) DN  
2) Clean & paint

Condition State 4 **Corrosion is advanced. Section loss is sufficient to warrant structural analysis** to ascertain the impact on the ultimate strength and/or serviceability of either the element or the bridge.

Feasible actions: 1) DN  
2) Rehab unit  
3) Replace unit

## Units:LF of Girder

This element defines only those steel closed web/box girder units that are painted. Report the estimated lineal feet in each of Condition States 2 through 5. The number of units in Condition State 1 will be the remainder of the units after deducting those reported in Condition States 2 through 5.

	CDOT SUGGESTED CONDITION STATES FOR CORROSION ON PAINTED STEEL ELEMENTS	
	Description	CS
Light	Slight peeling of the paint, pitting, or surface rust, etc. No measurable section loss	2
R1	Peeling of the paint, pitting, surface rust, etc. No measurable section loss	3
R2	Flaking, minor section loss ( $\leq 10\%$ thickness loss)	4
R3	Flaking, swelling, mod. section loss ( $10\% < \text{thickness loss} \leq 30\%$ ) <b>structural analysis is not warranted.</b>	4
R3	Flaking, swelling, mod. section loss ( $10\% < \text{thickness loss} \leq 30\%$ ) <b>structural analysis is warranted due to location of corrosion on the member.</b>	5
R4	Heavy section loss ( $> 30\%$ thickness loss), may have holes through base metal	5

Condition State 1 There is no evidence of active corrosion and the paint system is sound and functioning as intended to protect the metal surface.

- Feasible actions: 1) DN  
2) Surface clean

Condition State 2 **There is little or no active corrosion.** Surface or freckled rust has formed or is forming. The paint system may be chalking, peeling, curling or showing other early evidence of paint system distress but **there is no exposure of metal.**

- Feasible actions: 1) DN  
2) Surface clean  
3) Surface clean & restore top coat

Condition State 3 **Surface or freckled rust is prevalent.** The paint system is no longer effective. **There may be exposed metal** but there is no active corrosion which is causing loss of section.

- Feasible actions: 1) DN  
2) Spot blast, clean & paint

Condition State 4 The **paint system has failed.** **Surface pitting may be present** but any section loss due to active corrosion does not yet warrant structural analysis of either the element or the bridge.

- Feasible actions: 1) DN  
2) Spot blast, clean & paint  
3) Replace paint system

Condition State 5 **Corrosion has caused section loss and is sufficient to warrant structural analysis** to ascertain the impact on the ultimate strength and/or serviceability of either the element or the bridge.

- Feasible actions: 1) DN  
2) Major rehab unit  
3) Replace unit

Units: LF of Girder

This element defines only those closed web/box girder units constructed of prestressed concrete. Report the estimated lineal feet in each of Condition States 2 through 4. The number of units in Condition State 1 will be the remainder of the units after deducting those reported in Condition States 2 through 4.

CDOT SUGGESTED CONDITION STATES FOR CRACKS IN PRESTRESSED CONCRETE GIRDERS			
CS1	CS2	CS3	CS4
$\leq 0.10$ mm ( $\leq 0.004$ in)	$0.10 < W \leq 0.25$ (0.004 in)(0.009 in)	$0.25 < W \leq 0.76$ (0.009 in) (0.030 in)	$W > 0.76$ mm ( $> 0.030$ in)

CDOT SUGGESTED CONDITION STATES FOR PERCENT LOSS OF BEARING AREA			
LOSS OF BEARING AREA(%)			
PERCENT LOSS	$\leq 10\%$	$10 < \% \leq 20$	$> 20\%$
CONDITION STATES	2	3	4

**CDOT Note:** The total quantity for this element is the product of the length times the number of cells.

Condition State 1 The element shows no deterioration. There may be discoloration, efflorescence, and/or superficial cracking but without effect on strength and/or serviceability.

Feasible actions: 1) DN

Condition State 2 Minor cracks and spalls may be present and there may be exposed reinforcing with no evidence of corrosion. There is no exposure of the prestress system.

Feasible actions: 1) DN  
2) Seal cracks minor patch

Condition State 3 Some delaminations and/or spalls may be present. There may be minor exposure but no deterioration of the prestress system. Corrosion of non-prestressed reinforcement may be present but loss of section is incidental and does not significantly affect the strength and/or serviceability of either the element or the bridge.

Feasible actions: 1) DN  
2) Clean steel & patch, (&/or seal)

Condition State 4 Delaminations, spalls and corrosion on non-prestressed reinforcement are prevalent. There may also be exposure and deterioration of the prestress system (manifested by loss of bond, broken strands or wire, failed anchorages, etc). There is sufficient concern to warrant an analysis to ascertain the impact on the strength and/or serviceability of either the element or the bridge.

Feasible actions: 1) DN  
2) Rehab unit  
3) Replace unit

Units: LF of Girder

This element defines only those closed web/box girder units constructed of reinforced concrete. Report the estimated lineal feet in each of Condition States 2 through 4. The number of units in Condition State 1 will be the remainder of the units after deducting those reported in Condition States 2 through 4.

SUGGESTED CONDITION STATES FOR CRACKS IN MILDLY REINFORCED CONCRETE GIRDERS						
WIDTH (W) in millimeters (inches)						
TYPE OF CRACK	NONE	$\leq 0.8$ mm ( $\leq 1/32$ in)	$0.8 < W \leq 2$ (1/32)(1/16)	$2 < W \leq 2.5$ (1/16)(3/32)	$2.5 < W \leq 3$ (3/32)(1/8)	$W > 3$ mm ( $> 1/8$ in)
SHEAR	1	2	2	3	4	4
FLEXURE	1	1	2	3	4	4
DIAGONAL	1	2	2	3	3	4

CDOT SUGGESTED CONDITION STATES FOR PERCENT LOSS OF BEARING AREA			
LOSS OF BEARING AREA(%)			
PERCENT LOSS	$\leq 10\%$	$10 < \% \leq 20$	$> 20\%$
CONDITION STATES	2	3	4

**CDOT Note:** The total quantity for this element is the product of the length times the number of cells.

Condition State 1 The element shows no deterioration. There **may be discoloration, efflorescence, and/or superficial cracking** but without effect on strength and/or serviceability.

Feasible actions: 1) DN

Condition State 2 **Minor cracks & spalls may be present** but there is **no exposed reinforcing or surface evidence of rebar corrosion**.

Feasible actions: 1) DN  
2) Seal cracks minor patch

Condition State 3 **Some delaminations and/or spalls may be present and some reinforcing may be exposed. Corrosion of rebar may be present but loss of section is incidental** and does not significantly affect the strength and/or serviceability of either the element or the bridge.

Feasible actions: 1) DN  
2) Clean rebar & patch, (and/or seal)

Condition State 4 Advanced deterioration. **Corrosion of reinforcement and/or loss of concrete section is sufficient to warrant analysis** to ascertain the impact on the strength and/or serviceability of either the element or the bridge.

Feasible actions: 1) DN  
2) Rehab unit  
3) Replace unit

Units: LF of Girder

This element defines only those steel open girders/units that are not painted or are constructed of weathering steel. Report the estimated lineal feet in each of Condition States 2 through 4. The number of units in Condition State 1 will be the remainder of the units after deducting those reported in Condition States 2 through 4.

CDOT SUGGESTED CONDITION STATES FOR CORROSION ON UNPAINTED STEEL ELEMENTS		
	Description	CS
R1	Pitting or surface rust, etc. No measurable section loss	2
R2	Flaking, minor section loss ( $\leq 10\%$ thickness loss)	3
R3	Flaking, swelling, mod. section loss ( $10\% < \text{thickness loss} \leq 30\%$ ) <b>structural analysis is not warranted.</b>	3
R3	Flaking, swelling, mod. section loss ( $10\% < \text{thickness loss} \leq 30\%$ ) <b>structural analysis is warranted due to location of corrosion on the member.</b>	4
R4	Heavy section loss ( $> 30\%$ thickness loss), may have holes through base metal.	4

Condition State 1      **There is little or no corrosion** of the unpainted steel. The weathering steel is coating uniformly and remains in excellent condition.

Feasible actions:      1)      DN

Condition State 2      **Surface rust, surface pitting, has formed or is forming** on the unpainted steel. The weathering steel has not corroded beyond design limits. Weathering steel color is yellow orange to light brown.

Feasible actions:      1)      DN  
                                 2)      Clean & paint

Condition State 3      **Steel has measurable section loss due to corrosion but does not warrant structural analysis.** Weathering steel is dark brown or black.

Feasible actions:      1)      DN  
                                 2)      Clean & paint

Condition State 4      Corrosion is advanced.      **Section loss is sufficient to warrant structural analysis** to ascertain the impact on the ultimate strength and/or serviceability of either the element or the bridge.

Feasible actions:      1)      DN  
                                 2)      Rehab unit  
                                 3)      Replace unit

**Units: LF of Girder**

This element defines only those steel open girders/units that are painted. Report the estimated lineal feet in each of Condition States 2 through 5. The number of units in Condition State 1 will be the remainder of the units after deducting those reported in Condition States 2 through 5.

	CDOT SUGGESTED CONDITION STATES FOR CORROSION ON PAINTED STEEL ELEMENTS	
	Description	CS
Light	Slight peeling of the paint, pitting, or surface rust, etc.	2
R1	No measurable section loss	
R1	Peeling of the paint, pitting, surface rust, etc. No measurable section loss	3
R2	Flaking, minor section loss ( $\leq 10\%$ thickness loss)	4
R3	Flaking, swelling, mod. section loss ( $10\% < \text{thickness loss} \leq 30\%$ ) <b>structural analysis is not warranted.</b>	4
R3	Flaking, swelling, mod. section loss ( $10\% < \text{thickness loss} \leq 30\%$ ) <b>structural analysis is warranted due to location of corrosion on the member.</b>	5
R4	Heavy section loss ( $> 30\%$ thickness loss), may have holes through base metal	5

Condition State 1 There is no evidence of active corrosion and the paint system is sound and functioning as intended to protect the metal surface.

- Feasible actions: 1) DN  
2) Surface clean

Condition State 2 **There is little or no active corrosion.** Surface or freckled rust has formed or is forming. The paint system may be chalking, peeling, curling or showing other early evidence of paint system distress but **there is no exposure of metal.**

- Feasible actions: 1) DN  
2) Surface clean  
3) Surface clean & restore top coat

Condition State 3 **Surface or freckled rust is prevalent.** The paint system is no longer effective. **There may be exposed metal** but there is no active corrosion which is causing loss of section.

- Feasible actions: 1) DN  
2) Spot blast, clean & paint

Condition State 4 The **paint system has failed.** **Surface pitting may be present** but any section loss due to active corrosion does not yet warrant structural analysis of either the element or the bridge.

- Feasible actions: 1) DN  
2) Spot blast, clean & paint  
3) Replace paint system

Condition State 5 **Corrosion has caused section loss and is sufficient to warrant structural analysis** to ascertain the impact on the ultimate strength and/or serviceability of either the element or the bridge.

- Feasible actions: 1) DN  
2) Major rehab unit  
3) Replace unit



Units: LF of Girder

This element defines open girders constructed of prestressed concrete. Report the estimated lineal feet in each of Condition States 2 through 4 for each girder. The number of units in Condition State 1 will be the remainder of the units after deducting those reported in Condition States 2 through 4.

CDOT SUGGESTED CONDITION STATES FOR CRACKS IN PRESTRESSED CONCRETE GIRDERS			
CS1	CS2	CS3	CS4
$\leq 0.10$ mm ( $\leq 0.004$ in)	$0.10 < W \leq 0.25$ (0.004 in)(0.009 in)	$0.25 < W \leq 0.76$ (0.009 in) (0.030 in)	$W > 0.76$ mm ( $> 0.030$ in)

CDOT SUGGESTED CONDITION STATES FOR PERCENT LOSS OF BEARING AREA			
LOSS OF BEARING AREA(%)			
PERCENT LOSS	$\leq 10\%$	$10 < \% \leq 20$	$> 20\%$
CONDITION STATES	2	3	4

**CDOT Note: GCD27 - Prestressed double-tee (twin-tee) girders shall be counted as two girders. The reported length shall be per web.**

Condition State 1 The element show no deterioration. There may be discoloration, efflorescence, and/or superficial cracking but without effect on strength and/or serviceability.

Feasible actions: 1) DN

Condition State 2 Minor cracks and spalls may be present and there may be exposed reinforcing with no evidence of corrosion. There is no exposure of the prestress system.

Feasible actions: 1) DN  
2) Seal cracks minor patch

Condition State 3 Some delaminations and/or spalls may be present. There may be minor exposure but no deterioration of the prestress system. Corrosion of non-prestressed reinforcement may be present but loss of section is incidental and does not significantly affect the strength and/or serviceability of either the element or the bridge.

Feasible actions: 1) DN  
2) Clean steel & patch, (&/or seal)

Condition State 4 Delaminations, spalls and corrosion on non-prestressed reinforcement are prevalent. There may also be exposure and deterioration of the prestress system (manifested by loss of bond, broken strands or wire, failed anchorages, etc). There is sufficient concern to warrant an analysis to ascertain the impact on the strength and/or serviceability of either the element or the bridge.

Feasible actions: 1) DN  
2) Rehab unit  
3) Replace unit

Units: LF of Girder

This element defines only those open girders/units constructed of reinforced concrete. Report the estimated lineal feet in each of Condition States 2 through 4. The number of units in Condition State 1 will be the remainder of the units after deducting those reported in Condition States 2 through 4.

SUGGESTED CONDITION STATES FOR CRACKS IN MILDLY REINFORCED CONCRETE GIRDERS						
WIDTH (W) in millimeters (inches)						
TYPE OF CRACK	NONE	$\leq 0.8$ mm ( $\leq 1/32$ in)	$0.8 < W \leq 2$ (1/32)(1/16)	$2 < W \leq 2.5$ (1/16)(3/32)	$2.5 < W \leq 3$ (3/32)(1/8)	$W > 3$ mm ( $> 1/8$ in)
SHEAR	1	2	2	3	4	4
FLEXURE	1	1	2	3	4	4
DIAGONAL	1	2	2	3	3	4

CDOT SUGGESTED CONDITION STATES FOR PERCENT LOSS OF BEARING AREA			
LOSS OF BEARING AREA(%)			
PERCENT LOSS	$\leq 10\%$	$10 < \% \leq 20$	$> 20\%$
CONDITION STATES	2	3	4

Condition State 1 The element **shows no deterioration**. There may be **discoloration, efflorescence, and/or superficial** cracking but without effect on strength and/or serviceability.

Feasible actions: 1) DN

Condition State 2 **Minor cracks & spalls may be present** but there is **no exposed reinforcing or surface evidence of rebar corrosion**.

Feasible actions: 1) DN  
2) Seal cracks minor patch

Condition State 3 **Some delaminations and/or spalls may be present and some reinforcing may be exposed**. Corrosion of rebar may be present but loss of section is incidental and does not significantly affect the strength and/or serviceability of either the element or the bridge.

Feasible actions: 1) DN  
2) Clean rebar & patch, (and/or seal)

Condition State 4 Advanced deterioration. **Corrosion of reinforcement and/or loss of concrete section is sufficient to warrant analysis** to ascertain the impact on the strength and/or serviceability of either the element or the bridge.

Feasible actions: 1) DN  
2) Rehab unit  
3) Replace unit

Units: LF of Girder

This element defines only those open girders of timber construction. Report the number of girders in each of Condition States 2 through 4. The number of units in Condition State 1 will be the remainder of units after deducting those reported in Condition States 2 through 4.

CDOT SUGGESTED CONDITION STATES FOR TIMBER GIRDERS, STRINGERS, CAPS AND FLOORBEAMS		
Splits < 3 ft long or checks > 1" deep = CS 2	Splits ≥ 3 ft long = CS 4	Any stress related full width crack (thickness of the section) = CS 4

CDOT SUGGESTED CONDITION STATES FOR PERCENT LOSS OF BEARING AREA			
LOSS OF BEARING AREA(%)			
PERCENT LOSS	≤ 10%	10 < % ≤ 20	> 20%
CONDITION STATES	2	3	4

**CDOT Note: GCD28 - Timber girders or stringers which have been doubled for repair shall be designated with an apostrophe, e.g. Girders E and E'. The reported length of girder shall not be doubled.**

Condition State 1 Investigation indicates **no decay**. There may be **superficial cracks, splits and checks** having no effect on strength or serviceability.

Feasible actions: 1) DN

Condition State 2 **Decay, insect infestation/marine borer infestation, abrasion, splitting, cracking, checking or crushing** may exist but none is sufficiently advanced to affect serviceability of the element.

Feasible actions: 1) DN  
2) Rehab &/or protect unit

Condition State 3 **Decay, insect infestation, abrasion, splitting, cracking or crushing** has produced **loss of strength of the element but not of a sufficient magnitude** to affect the serviceability of the bridge.

Feasible actions: 1) DN  
2) Rehab unit  
3) Replace unit

Condition State 4 Advanced deterioration. **Decay, insect infestation, abrasion, splits, cracks or crushing** has produced **loss of strength** that affects the serviceability of the bridge.

Feasible actions: 1) DN  
2) Rehab unit  
3) Replace unit

Units: LF of Stringer

A stringer is defined as those elements which support the deck in a stringer/floor beam/girder (or truss) system. Report the estimated lineal feet in each Condition States 2 through 4. The number of units in Condition State 1 will be the remainder of the units after deducting those reported in Condition States 2 through 4.

	CDOT SUGGESTED CONDITION STATES FOR CORROSION ON UNPAINTED STEEL ELEMENTS	
	Description	CS
R1	Pitting or surface rust, etc. No measurable section loss	2
R2	Flaking, minor section loss ( $\leq 10\%$ thickness loss)	3
R3	Flaking, swelling, mod. section loss ( $10\% < \text{thickness loss} \leq 30\%$ ) <b>structural analysis is not warranted.</b>	3
R3	Flaking, swelling, mod. section loss ( $10\% < \text{thickness loss} \leq 30\%$ ) <b>structural analysis is warranted due to location of corrosion on the member.</b>	4
R4	Heavy section loss ( $> 30\%$ thickness loss), may have holes through base metal.	4

Condition State 1 **There is little or no corrosion** of the unpainted steel. The weathering steel is coating uniformly and remains in excellent condition.

Feasible actions: 1) DN

Condition State 2 **Surface rust, surface pitting, has formed or is forming** on the unpainted steel. The weathering steel has not corroded beyond design limits. Weathering steel color is yellow orange to light brown.

Feasible actions: 1) DN  
2) Clean & paint

Condition State 3 **Steel has measurable section loss due to corrosion but does not warrant structural analysis.** Weathering steel is dark brown or black.

Feasible actions: 1) DN  
2) Clean & paint

Condition State 4 Corrosion is advanced. **Section loss is sufficient to warrant structural analysis** to ascertain the impact on the ultimate strength and/or serviceability of either the element or the bridge.

Feasible actions: 1) DN  
2) Rehab unit  
3) Replace unit

**Units: LF of Stringer**

A stringer is defined as those elements which support the deck in a stringer/floor beam/girder (or truss) system. Report the estimated lineal feet in each Condition States 2 through 4. The number of units in Condition State 1 will be the remainder of the units after deducting those reported in Condition States 2 through 4.

	CDOT SUGGESTED CONDITION STATES FOR CORROSION ON PAINTED STEEL ELEMENTS	
	Description	CS
Light	Slight peeling of the paint, pitting, or surface rust, etc. No measurable section loss	2
R1	Peeling of the paint, pitting, surface rust, etc. No measurable section loss	3
R2	Flaking, minor section loss ( $\leq 10\%$ thickness loss)	4
R3	Flaking, swelling, mod. section loss ( $10\% < \text{thickness loss} \leq 30\%$ ) <b>structural analysis is not warranted.</b>	4
R3	Flaking, swelling, mod. section loss ( $10\% < \text{thickness loss} \leq 30\%$ ) <b>structural analysis is warranted due to location of corrosion on the member.</b>	5
R4	Heavy section loss ( $> 30\%$ thickness loss), may have holes through base metal	5

Condition State 1 There is no evidence of active corrosion and the paint system is sound and functioning as intended to protect the metal surface.

- Feasible actions: 1) DN  
2) Surface clean

Condition State 2 **There is little or no active corrosion.** Surface or freckled rust has formed or is forming. The paint system may be chalking, peeling, curling or showing other early evidence of paint system distress but **there is no exposure of metal.**

- Feasible actions: 1) DN  
2) Surface clean  
3) Surface clean & restore top coat

Condition State 3 **Surface or freckled rust is prevalent.** The paint system is no longer effective. **There may be exposed metal** but there is no active corrosion which is causing loss of section.

- Feasible actions: 1) DN  
2) Spot blast, clean & paint

Condition State 4 The **paint system has failed.** **Surface pitting may be present** but any section loss due to active corrosion does not yet warrant structural analysis of either the element or the bridge.

- Feasible actions: 1) DN  
2) Spot blast, clean & paint  
3) Replace paint system

Condition State 5 **Corrosion has caused section loss and is sufficient to warrant structural analysis** to ascertain the impact on the ultimate strength and/or serviceability of either the element or the bridge.

- Feasible actions: 1) DN  
2) Major rehab unit  
3) Replace unit

Units: LF of Stringer

A stringer is defined as those elements which support the deck in a stringer/floor beam/girder (or truss) system. Report the estimated lineal feet in each Condition States 2 through 4. The number of units in Condition State 1 will be the remainder of the units after deducting those reported in Condition States 2 through 4.

CDOT SUGGESTED CONDITION STATES FOR CRACKS IN PRESTRESSED CONCRETE GIRDERS			
CS1	CS2	CS3	CS4
$\leq 0.10$ mm ( $\leq 0.004$ in)	$0.10 < W \leq 0.25$ (0.004 in)(0.009 in)	$0.25 < W \leq 0.76$ (0.009 in) (0.030 in)	$W > 0.76$ mm ( $> 0.030$ in)

CDOT SUGGESTED CONDITION STATES FOR PERCENT LOSS OF BEARING AREA			
LOSS OF BEARING AREA(%)			
PERCENT LOSS	$\leq 10\%$	$10 < \% \leq 20$	$> 20\%$
CONDITION STATES	2	3	4

Condition State 1 The element **show no deterioration**. There **may be discoloration, efflorescence, and/or superficial cracking** but without effect on strength and/or serviceability.

Feasible actions: 1) DN

Condition State 2 **Minor cracks and spalls** may be present and there **may be exposed reinforcing with no evidence of corrosion**. There is no exposure of the prestress system.

Feasible actions: 1) DN  
2) Seal cracks minor patch

Condition State 3 Some **delaminations and/or spalls may be present**. There may be **minor exposure but no deterioration of the prestress system**. **Corrosion of non-prestressed reinforcement may be present** but loss of section is incidental and does not significantly affect the strength and/or serviceability of either the element or the bridge.

Feasible actions: 1) DN  
2) Clean steel & patch, (&/or seal)

Condition State 4 **Delaminations, spalls and corrosion on non-prestressed reinforcement are prevalent**. There may also be **exposure and deterioration of the prestress system** (manifested by **loss of bond, broken strands or wire, failed anchorages, etc**). There is sufficient concern to warrant an analysis to ascertain the impact on the strength and/or serviceability of either the element or the bridge.

Feasible actions: 1) DN  
2) Rehab unit  
3) Replace unit

Units: LF of Stringer

A stringer is defined as those elements which support the deck in a stringer/floor beam/girder (or truss) system. Report the estimated lineal feet in each Condition States 2 through 4. The number of units in Condition State 1 will be the remainder of the units after deducting those reported in Condition States 2 through 4.

SUGGESTED CONDITION STATES FOR CRACKS IN MILDLY REINFORCED CONCRETE GIRDERS						
WIDTH (W) in millimeters (inches)						
TYPE OF CRACK	NONE	$\leq 0.8$ mm ( $\leq 1/32$ in)	$0.8 < W \leq 2$ ( $1/32$ )( $1/16$ )	$2 < W \leq 2.5$ ( $1/16$ )( $3/32$ )	$2.5 < W \leq 3$ ( $3/32$ )( $1/8$ )	$W > 3$ mm ( $> 1/8$ in)
SHEAR	1	2	2	3	4	4
FLEXURE	1	1	2	3	4	4
DIAGONAL	1	2	2	3	3	4

CDOT SUGGESTED CONDITION STATES FOR PERCENT LOSS OF BEARING AREA			
LOSS OF BEARING AREA(%)			
PERCENT LOSS	$\leq 10\%$	$10 < \% \leq 20$	$> 20\%$
CONDITION STATES	2	3	4

Condition State 1 The element shows no deterioration. There may be discoloration, efflorescence, and/or superficial cracking but without effect on strength and/or serviceability.

Feasible actions: 1) DN

Condition State 2 Minor cracks & spalls may be present but there is no exposed reinforcing or surface evidence of rebar corrosion.

Feasible actions: 1) DN  
2) Seal cracks minor patch

Condition State 3 Some delaminations and/or spalls may be present and some reinforcing may be exposed. Corrosion of rebar may be present but loss of section is incidental and does not significantly affect the strength and/or serviceability of either the element or the bridge.

Feasible actions: 1) DN  
2) Clean rebar & patch, (and/or seal)

Condition State 4 Advanced deterioration. Corrosion of reinforcement and/or loss of concrete section is sufficient to warrant analysis to ascertain the impact on the strength and/or serviceability of either the element or the bridge.

Feasible actions: 1) DN  
2) Rehab unit  
3) Replace unit

Units: LF of Stringer

A stringer is defined as those elements which support the deck in a stringer/floor beam/girder (or truss) system. Report the estimated lineal feet in each Condition States 2 through 4. The number of units in Condition State 1 will be the remainder of the units after deducting those reported in Condition States 2 through 4.

CDOT SUGGESTED CONDITION STATES FOR TIMBER GIRDERS, STRINGERS, CAPS AND FLOORBEAMS		
Splits < 3 ft long or checks > 1" deep = CS 2	Splits ≥ 3 ft long = CS 4	Any stress related full width crack (thickness of the section) = CS 4

CDOT SUGGESTED CONDITION STATES FOR PERCENT LOSS OF BEARING AREA			
LOSS OF BEARING AREA(%)			
PERCENT LOSS	≤ 10%	10 < % ≤ 20	> 20%
CONDITION STATES	2	3	4

**CDOT Note: GCD28 - Timber girders or stringers which have been doubled for repair shall be designated with an apostrophe, e.g. Girders E and E'. The reported length of girder shall not be doubled.**

Condition State 1 Investigation indicates **no decay**. There may be **superficial cracks, splits and checks** having no effect on strength or serviceability.

Feasible actions: 1) DN

Condition State 2 **Decay, insect infestation/marine borer infestation, abrasion, splitting, cracking, checking or crushing may exist** but none is sufficiently advanced to affect serviceability of the element.

Feasible actions: 1) DN  
2) Rehab &/or protect unit

Condition State 3 **Decay, insect infestation, abrasion, splitting, cracking or crushing** has produced **loss of strength of the element but not of a sufficient magnitude** to affect the serviceability of the bridge.

Feasible actions: 1) DN  
2) Rehab unit  
3) Replace unit

Condition State 4 Advanced deterioration. **Decay, insect infestation, abrasion, splits, cracks or crushing** has produced **loss of strength** that affects the serviceability of the bridge.

Feasible actions: 1) DN  
2) Rehab unit  
3) Replace unit



Units: LF of Truss

This element defines the bottom chord of unpainted steel trusses or are constructed of weathering steel. Report the estimated lineal feet in each of Condition States 2 through 4. The number of units in Condition State 1 will be the remainder of the units after deducting those reported in Condition States 2 through 4. Only report lengths along the span. Do not add web member lengths.

	CDOT SUGGESTED CONDITION STATES FOR CORROSION ON UNPAINTED STEEL ELEMENTS	
	Description	CS
R1	Pitting or surface rust, etc. No measurable section loss	2
R2	Flaking, minor section loss ( $\leq 10\%$ thickness loss)	3
R3	Flaking, swelling, mod. section loss ( $10\% < \text{thickness loss} \leq 30\%$ ) <b>structural analysis is not warranted.</b>	3
R3	Flaking, swelling, mod. section loss ( $10\% < \text{thickness loss} \leq 30\%$ ) <b>structural analysis is warranted due to location of corrosion on the member.</b>	4
R4	Heavy section loss ( $> 30\%$ thickness loss), may have holes through base metal.	4

Condition State 1 **There is little or no corrosion** of the unpainted steel. The weathering steel is coating uniformly and remains in excellent condition.

Feasible actions: 1) DN

Condition State 2 **Surface rust, surface pitting, has formed or is forming** on the unpainted steel. The weathering steel has not corroded beyond design limits. Weathering steel color is yellow orange to light brown.

Feasible actions: 1) DN  
2) Clean & paint

Condition State 3 **Steel has measurable section loss due to corrosion but does not warrant structural analysis.** Weathering steel is dark brown or black.

Feasible actions: 1) DN  
2) Clean & paint

Condition State 4 Corrosion is advanced. **Section loss is sufficient to warrant structural analysis** to ascertain the impact on the ultimate strength and/or serviceability of either the element or the bridge.

Feasible actions: 1) DN  
2) Rehab unit  
3) Replace unit

**Units: LF of Truss**

This element defines the bottom chord of painted steel trusses. Report the estimated lineal feet in each of Condition States 3 through 5. The number of units in Condition State 1 will be the remainder of the units after deducting those reported in Condition States 2 through 5. Only report lengths along the span. Do not add web member lengths.

	CDOT SUGGESTED CONDITION STATES FOR CORROSION ON PAINTED STEEL ELEMENTS	
	Description	CS
Light R1	Slight peeling of the paint, pitting, or surface rust, etc. No measurable section loss	2
R1	Peeling of the paint, pitting, surface rust, etc. No measurable section loss	3
R2	Flaking, minor section loss ( $\leq 10\%$ thickness loss)	4
R3	Flaking, swelling, mod. section loss ( $10\% < \text{thickness loss} \leq 30\%$ ) <b>structural analysis is not warranted.</b>	4
R3	Flaking, swelling, mod. section loss ( $10\% < \text{thickness loss} \leq 30\%$ ) <b>structural analysis is warranted due to location of corrosion on the member.</b>	5
R4	Heavy section loss ( $> 30\%$ thickness loss), may have holes through base metal	5

Condition State 1 There is no evidence of active corrosion and the paint system is sound and functioning as intended to protect the metal surface.

- Feasible actions: 1) DN  
2) Surface clean

Condition State 2 **There is little or no active corrosion.** Surface or freckled rust has formed or is forming. The paint system may be chalking, peeling, curling or showing other early evidence of paint system distress but **there is no exposure of metal.**

- Feasible actions: 1) DN  
2) Surface clean  
3) Surface clean & restore top coat

Condition State 3 **Surface or freckled rust is prevalent.** The paint system is no longer effective. **There may be exposed metal** but there is no active corrosion which is causing loss of section.

- Feasible actions: 1) DN  
2) Spot blast, clean & paint

Condition State 4 **The paint system has failed.** **Surface pitting may be present** but any section loss due to active corrosion does not yet warrant structural analysis of either the element or the bridge.

- Feasible actions: 1) DN  
2) Spot blast, clean & paint  
3) Replace paint system

Condition State 5 **Corrosion has caused section loss and is sufficient to warrant structural analysis** to ascertain the impact on the ultimate strength and/or serviceability of either the element or the bridge.

- Feasible actions: 1) DN  
2) Major rehab unit  
3) Replace unit

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**125 Steel - Through Truss excluding Bottom Chord - Unpainted 125**  
**Superstructure(10)**

**Units: LF of Truss Min Rpt Lgth = One Panel GCD16**

This element defines all truss elements except the bottom chord of unpainted steel trusses or those constructed of weathering steel. Report the estimated lineal feet in each of Condition States 2 through 4. The number of units in Condition State 1 will be the remainder of the units after deducting those reported in Condition States 2 through 4. Only report lengths along the span. Do not add web member lengths.

	CDOT SUGGESTED CONDITION STATES FOR CORROSION ON UNPAINTED STEEL ELEMENTS	
	Description	CS
R1	Pitting or surface rust, etc. No measurable section loss	2
R2	Flaking, minor section loss ( $\leq 10\%$ thickness loss)	3
R3	Flaking, swelling, mod. section loss ( $10\% < \text{thickness loss} \leq 30\%$ ) <b>structural analysis is not warranted.</b>	3
R3	Flaking, swelling, mod. section loss ( $10\% < \text{thickness loss} \leq 30\%$ ) <b>structural analysis is warranted due to location of corrosion on the member.</b>	4
R4	Heavy section loss ( $> 30\%$ thickness loss), may have holes through base metal.	4

Condition State 1      **There is little or no corrosion** of the unpainted steel. The weathering steel is coating uniformly and remains in excellent condition.

Feasible actions:      1)      DN

Condition State 2      **Surface rust, surface pitting, has formed or is forming** on the unpainted steel. The weathering steel has not corroded beyond design limits. Weathering steel color is yellow orange to light brown.

Feasible actions:      1)      DN  
                                 2)      Clean & paint

Condition State 3      **Steel has measurable section loss due to corrosion but does not warrant structural analysis.** Weathering steel is dark brown or black.

Feasible actions:      1)      DN  
                                 2)      Clean & paint

Condition State 4      Corrosion is advanced.      **Section loss is sufficient to warrant structural analysis** to ascertain the impact on the ultimate strength and/or serviceability of either the element or the bridge.

Feasible actions:      1)      DN  
                                 2)      Rehab unit  
                                 3)      Replace unit

**126 Steel - Through Truss excluding Bottom Chord - Painted** **126**  
**Superstructure(10)**

**Units:** LF of Truss Min Rpt Lgth = One Panel GCD16

This element defines all truss elements except the bottom chord of painted steel trusses. Report the estimated lineal feet in each of Condition States 2 through 5. The number of units in Condition State 1 will be the remainder of the units after deducting those reported in Condition States 2 through 5. Only report lengths along the span. Do not add web member lengths.

CDOT SUGGESTED CONDITION STATES FOR CORROSION ON PAINTED STEEL ELEMENTS		
	Description	CS
Light R1	Slight peeling of the paint, pitting, or surface rust, etc. No measurable section loss	2
R1	Peeling of the paint, pitting, surface rust, etc. No measurable section loss	3
R2	Flaking, minor section loss ( $\leq 10\%$ thickness loss)	4
R3	Flaking, swelling, mod. section loss ( $10\% < \text{thickness loss} \leq 30\%$ ) <b>structural analysis is not warranted.</b>	4
R3	Flaking, swelling, mod. section loss ( $10\% < \text{thickness loss} \leq 30\%$ ) <b>structural analysis is warranted due to location of corrosion on the member.</b>	5
R4	Heavy section loss ( $> 30\%$ thickness loss), may have holes through base metal	5

Condition State 1 There is no evidence of active corrosion and the paint system is sound and functioning as intended to protect the metal surface.

- Feasible actions: 1) DN  
2) Surface clean

Condition State 2 **There is little or no active corrosion.** Surface or freckled rust has formed or is forming. The paint system may be chalking, peeling, curling or showing other early evidence of paint system distress but **there is no exposure of metal.**

- Feasible actions: 1) DN  
2) Surface clean  
3) Surface clean & restore top coat

Condition State 3 **Surface or freckled rust is prevalent.** The paint system is no longer effective. **There may be exposed metal** but there is no active corrosion which is causing loss of section.

- Feasible actions: 1) DN  
2) Spot blast, clean & paint

Condition State 4 **The paint system has failed.** **Surface pitting may be present** but any section loss due to active corrosion does not yet warrant structural analysis of either the element or the bridge.

- Feasible actions: 1) DN  
2) Spot blast, clean & paint  
3) Replace paint system

Condition State 5 **Corrosion has caused section loss and is sufficient to warrant structural analysis** to ascertain the impact on the ultimate strength and/or serviceability of either the element or the bridge.

- Feasible actions: 1) DN  
2) Major rehab unit  
3) Replace unit

Units: LF of Truss Min Rpt Lgth = One Panel GCD16

This element defines all members of unpainted steel deck trusses or those constructed with weathering steel. Report the estimated lineal feet in each of Condition States 2 through 4. The number of units in Condition State 1 will be the remainder of the units after deducting those reported in Condition States 2 through 4. Only the report lengths along the span. Do not add web member lengths.

CDOT SUGGESTED CONDITION STATES FOR CORROSION ON UNPAINTED STEEL ELEMENTS		
	Description	CS
R1	Pitting or surface rust, etc. No measurable section loss	2
R2	Flaking, minor section loss ( $\leq 10\%$ thickness loss)	3
R3	Flaking, swelling, mod. section loss ( $10\% < \text{thickness loss} \leq 30\%$ ) <b>structural analysis is not warranted.</b>	3
R3	Flaking, swelling, mod. section loss ( $10\% < \text{thickness loss} \leq 30\%$ ) <b>structural analysis is warranted due to location of corrosion on the member.</b>	4
R4	Heavy section loss ( $> 30\%$ thickness loss), may have holes through base metal.	4

Condition State 1 **There is little or no corrosion** of the unpainted steel. The weathering steel is coating uniformly and remains in excellent condition.

Feasible actions: 1) DN

Condition State 2 **Surface rust, surface pitting, has formed or is forming** on the unpainted steel. The weathering steel has not corroded beyond design limits. Weathering steel color is yellow orange to light brown.

Feasible actions: 1) DN  
2) Clean & paint

Condition State 3 **Steel has measurable section loss due to corrosion but does not warrant structural analysis.** Weathering steel is dark brown or black.

Feasible actions: 1) DN  
2) Clean & paint

Condition State 4 Corrosion is advanced. **Section loss is sufficient to warrant structural analysis** to ascertain the impact on the ultimate strength and/or serviceability of either the element or the bridge.

Feasible actions: 1) DN  
2) Rehab unit  
3) Replace unit

**Units: LF of Truss Min Rpt Lgth = One Panel GCD16**

This element defines all members of painted steel deck trusses. Report the estimated lineal feet in each of Condition States 2 through 5 for each truss. The number of units in Condition State 1 will be the remainder of the units after deducting those reported in Condition States 2 through 5. Only report lengths along the span. Do not add web member lengths.

	CDOT SUGGESTED CONDITION STATES FOR CORROSION ON PAINTED STEEL ELEMENTS	
	Description	CS
Light R1	Slight peeling of the paint, pitting, or surface rust, etc. No measurable section loss	2
R1	Peeling of the paint, pitting, surface rust, etc. No measurable section loss	3
R2	Flaking, minor section loss ( $\leq 10\%$ thickness loss)	4
R3	Flaking, swelling, mod. section loss ( $10\% < \text{thickness loss} \leq 30\%$ ) <b>structural analysis is not warranted.</b>	4
R3	Flaking, swelling, mod. section loss ( $10\% < \text{thickness loss} \leq 30\%$ ) <b>structural analysis is warranted due to location of corrosion on the member.</b>	5
R4	Heavy section loss ( $> 30\%$ thickness loss), may have holes through base metal	5

Condition State 1 There is no evidence of active corrosion and the paint system is sound and functioning as intended to protect the metal surface.

- Feasible actions: 1) DN  
2) Surface clean

Condition State 2 **There is little or no active corrosion.** Surface or freckled rust has formed or is forming. The paint system may be chalking, peeling, curling or showing other early evidence of paint system distress but **there is no exposure of metal.**

- Feasible actions: 1) DN  
2) Surface clean  
3) Surface clean & restore top coat

Condition State 3 **Surface or freckled rust is prevalent.** The paint system is no longer effective. **There may be exposed metal** but there is no active corrosion which is causing loss of section.

- Feasible actions: 1) DN  
2) Spot blast, clean & paint

Condition State 4 **The paint system has failed. Surface pitting may be present** but any section loss due to active corrosion does not yet warrant structural analysis of either the element or the bridge.

- Feasible actions: 1) DN  
2) Spot blast, clean & paint  
3) Replace paint system

Condition State 5 **Corrosion has caused section loss and is sufficient to warrant structural analysis** to ascertain the impact on the ultimate strength and/or serviceability of either the element or the bridge.

- Feasible actions: 1) DN  
2) Major rehab unit  
3) Replace unit

Units:      LF of Truss      Min Rpt Lgth = One Panel      GCD16  
                  LF of Arch

This element defines all members of trusses and arches that are constructed of timber. Report the estimated number of lineal feet in each of Condition States 2 through 4. The number of units in Condition State 1 will be the remainder of the units after deducting those reported in Condition States 2 through 4.

CDOT SUGGESTED CONDITION STATES FOR TIMBER GIRDERS, STRINGERS, CAPS AND FLOORBEAMS		
Splits < 3 ft long or checks > 1" deep = CS 2	Splits ≥ 3 ft long = CS 4	Any stress related full width crack (thickness of the section) = CS 4

Condition State 1 Investigation indicates **no decay**. There may be **superficial cracks, splits and checks** having no effect on strength or serviceability.

Feasible actions:    1)    DN

Condition State 2 **Decay, insect infestation/marine borer infestation, abrasion, splitting, cracking, checking or crushing may exist** but none is sufficiently advanced to affect serviceability of the element.

Feasible actions:    1)    DN  
                                  2)    Rehab &/or protect unit

Condition State 3 **Decay, insect infestation, abrasion, splitting, cracking or crushing** has produced **loss of strength of the element but not of a sufficient magnitude** to affect the serviceability of the bridge.

Feasible actions:    1)    DN  
                                  2)    Rehab unit  
                                  3)    Replace unit

Condition State 4 Advanced deterioration. **Decay, insect infestation, abrasion, splits, cracks or crushing** has produced **loss of strength** that affects the serviceability of the bridge.

Feasible actions:    1)    DN  
                                  2)    Rehab unit  
                                  3)    Replace unit

Units: LF of Arch Min Rpt Lgth = One Panel GCD03 GCD16

This element defines all members of only those steel arches that are not painted or are constructed of weathering steel. Report the estimated number of lineal feet in each of Condition States 2 through 4. The number of units in Condition State 1 will be the remainder of the units after deducting those reported in Condition States 2 through 4. Only report lengths along the span. Do not add web member lengths.

CDOT SUGGESTED CONDITION STATES FOR CORROSION ON UNPAINTED STEEL ELEMENTS		
	Description	CS
R1	Pitting or surface rust, etc. No measurable section loss	2
R2	Flaking, minor section loss ( $\leq 10\%$ thickness loss)	3
R3	Flaking, swelling, mod. section loss ( $10\% < \text{thickness loss} \leq 30\%$ ) <b>structural analysis is not warranted.</b>	3
R3	Flaking, swelling, mod. section loss ( $10\% < \text{thickness loss} \leq 30\%$ ) <b>structural analysis is warranted due to location of corrosion on the member.</b>	4
R4	Heavy section loss ( $> 30\%$ thickness loss), may have holes through base metal.	4

Condition State 1      **There is little or no corrosion** of the unpainted steel. The weathering steel is coating uniformly and remains in excellent condition.

Feasible actions:      1)      DN

Condition State 2      **Surface rust, surface pitting, has formed or is forming** on the unpainted steel. The weathering steel has not corroded beyond design limits. Weathering steel color is yellow orange to light brown.

Feasible actions:      1)      DN  
                                 2)      Clean & paint

Condition State 3      **Steel has measurable section loss due to corrosion but does not warrant structural analysis.** Weathering steel is dark brown or black.

Feasible actions:      1)      DN  
                                 2)      Clean & paint

Condition State 4      Corrosion is advanced.      **Section loss is sufficient to warrant structural analysis** to ascertain the impact on the ultimate strength and/or serviceability of either the element or the bridge.

Feasible actions:      1)      DN  
                                 2)      Rehab unit  
                                 3)      Replace unit



## Superstructure(10)

Units: LF of Arch Min Rpt Lgth = One Panel GCD03 GCD16

This element defines all members of only those steel arches that are painted. Report the estimated number of lineal feet in each of Condition States 2 through 5. The number of units in Condition State 1 will be the remainder of the units after deducting those reported in Condition States 2 through 5. Only report lengths along the span. Do not add web member lengths.

CDOT SUGGESTED CONDITION STATES FOR CORROSION ON PAINTED STEEL ELEMENTS		
	Description	CS
Light	Slight peeling of the paint, pitting, or surface rust, etc. No measurable section loss	2
R1	Peeling of the paint, pitting, surface rust, etc. No measurable section loss	3
R2	Flaking, minor section loss ( $\leq 10\%$ thickness loss)	4
R3	Flaking, swelling, mod. section loss ( $10\% < \text{thickness loss} \leq 30\%$ ) <b>structural analysis is not warranted.</b>	4
R3	Flaking, swelling, mod. section loss ( $10\% < \text{thickness loss} \leq 30\%$ ) <b>structural analysis is warranted due to location of corrosion on the member.</b>	5
R4	Heavy section loss ( $> 30\%$ thickness loss), may have holes through base metal	5

Condition State 1 There is no evidence of active corrosion and the paint system is sound and functioning as intended to protect the metal surface.

- Feasible actions: 1) DN  
2) Surface clean

Condition State 2 **There is little or no active corrosion.** Surface or freckled rust has formed or is forming. The paint system may be chalking, peeling, curling or showing other early evidence of paint system distress but **there is no exposure of metal.**

- Feasible actions: 1) DN  
2) Surface clean  
3) Surface clean & restore top coat

Condition State 3 **Surface or freckled rust is prevalent.** The paint system is no longer effective. **There may be exposed metal** but there is no active corrosion which is causing loss of section.

- Feasible actions: 1) DN  
2) Spot blast, clean & paint

Condition State 4 **The paint system has failed.** **Surface pitting may be present** but any section loss due to active corrosion does not yet warrant structural analysis of either the element or the bridge.

- Feasible actions: 1) DN  
2) Spot blast, clean & paint  
3) Replace paint system

Condition State 5 **Corrosion has caused section loss and is sufficient to warrant structural analysis** to ascertain the impact on the ultimate strength and/or serviceability of either the element or the bridge.

- Feasible actions: 1) DN  
2) Major rehab unit  
3) Replace unit

Units: LF of Arch Min Rpt Lgth = One Panel GCD03 GCD16

This element defines only those arches constructed of prestressed concrete. Report the estimated number of lineal feet in each of Condition States 2 through 4. The number of units in Condition State 1 will be the remainder of the units after deducting those reported in Condition States 2 through 4.

CDOT SUGGESTED CONDITION STATES FOR CRACKS IN PRESTRESSED CONCRETE GIRDERS			
CS1	CS2	CS3	CS4
$\leq 0.10$ mm ( $\leq 0.004$ in)	$0.10 < W \leq 0.25$ (0.004 in)(0.009 in)	$0.25 < W \leq 0.76$ (0.009 in) (0.030 in)	$W > 0.76$ mm ( $> 0.030$ in)

Condition State 1 The element **show no deterioration**. There **may be discoloration, efflorescence, and/or superficial cracking** but without effect on strength and/or serviceability.

Feasible actions: 1) DN

Condition State 2 **Minor cracks and spalls** may be present and there **may be exposed reinforcing with no evidence of corrosion**. There is no exposure of the prestress system.

Feasible actions: 1) DN  
2) Seal cracks minor patch

Condition State 3 Some **delaminations and/or spalls may be present**. There may be **minor exposure but no deterioration of the prestress system**. **Corrosion of non-prestressed reinforcement may be present** but loss of section is incidental and does not significantly affect the strength and/or serviceability of either the element or the bridge.

Feasible actions: 1) DN  
2) Clean steel & patch, (&/or seal)

Condition State 4 **Delaminations, spalls and corrosion on non-prestressed reinforcement are prevalent**. There may also be **exposure and deterioration of the prestress system** (manifested by **loss of bond, broken strands or wire, failed anchorages, etc**). There is sufficient concern to warrant an analysis to ascertain the impact on the strength and/or serviceability of either the element or the bridge.

Feasible actions: 1) DN  
2) Rehab unit  
3) Replace unit

Units: LF of Arch Min Rpt Lgth = One Panel GCD03 GCD16

This element defines only those arches (open/closed spandrel, earth filled, bowstring, etc.) constructed of reinforced concrete. Report the estimated number of lineal feet in each of Condition States 2 through 4. The number of units in Condition State 1 will be the remainder of the units after deducting those reported in Condition States 2 through 4.

SUGGESTED CONDITION STATES FOR CRACKS IN MILDLY REINFORCED CONCRETE GIRDERS						
WIDTH (W) in millimeters (inches)						
TYPE OF CRACK	NONE	$\leq 0.8$ mm ( $\leq 1/32$ in)	$0.8 < W \leq 2$ ( $1/32$ )( $1/16$ )	$2 < W \leq 2.5$ ( $1/16$ )( $3/32$ )	$2.5 < W \leq 3$ ( $3/32$ )( $1/8$ )	$W > 3$ mm ( $> 1/8$ in)
SHEAR	1	2	2	3	4	4
FLEXURE	1	1	2	3	4	4
DIAGONAL	1	2	2	3	3	4

Condition State 1 The element shows no deterioration. There **may be discoloration, efflorescence, and/or superficial cracking** but without effect on strength and/or serviceability.

Feasible actions: 1) DN

Condition State 2 **Minor cracks & spalls may be present** but there is **no exposed reinforcing or surface evidence of rebar corrosion**.

Feasible actions: 1) DN  
2) Seal cracks minor patch

Condition State 3 **Some delaminations and/or spalls may be present** and **some reinforcing may be exposed**. Corrosion of rebar **may be present but loss of section is incidental** and does not significantly affect the strength and/or serviceability of either the element or the bridge.

Feasible actions: 1) DN  
2) Clean rebar & patch, (and/or seal)

Condition State 4 Advanced deterioration. **Corrosion of reinforcement and/or loss of concrete section is sufficient to warrant analysis** to ascertain the impact on the strength and/or serviceability of either the element or the bridge.

Feasible actions: 1) DN  
2) Rehab unit  
3) Replace unit

Units: LF

This element defines arches made of masonry or any other material except steel, concrete, or timber.

Condition State 1 There is **little or no deterioration**. Surface defects only are in evidence.

Feasible actions: 1) DN

Condition State 2 There may be **minor deterioration, cracking and weathering**. Mortar in joints may show **minor deterioration**.

Feasible actions: 1) DN  
2) Rehab unit

Condition State 3 **Moderate to major** deterioration and cracking. **Major** deterioration of joints.

Feasible actions: 1) DN  
2) Rehab unit

Condition State 4 **Major deterioration, splitting, or cracking** of materials may be **affecting the structural capacity** of the element.

Feasible actions: 1) DN  
2) Rehab unit  
3) Replace unit

Units: Each

This element defines only those steel cables not embedded in concrete. Report the number of individual cables in each of Condition States 2 through 4. The number of cables in Condition State 1 will be the total number of cables on the bridge less those reported in Condition States 2 through 4.

	CDOT SUGGESTED CONDITION STATES FOR CORROSION ON UNPAINTED STEEL ELEMENTS	
	Description	CS
R1	Pitting or surface rust, etc. No measurable section loss	2
R2	Flaking, minor section loss ( $\leq 10\%$ thickness loss)	3
R3	Flaking, swelling, mod. section loss ( $10\% < \text{thickness loss} \leq 30\%$ ) <b>structural analysis is not warranted.</b>	3
R3	Flaking, swelling, mod. section loss ( $10\% < \text{thickness loss} \leq 30\%$ ) <b>structural analysis is warranted due to location of corrosion on the member.</b>	4
R4	Heavy section loss ( $> 30\%$ thickness loss), may have holes through base metal.	4

Condition State 1 There is **little or no corrosion of unpainted steel**. Strand and anchor sockets show no signs of distress.

Feasible actions: 1) DN

Condition State 2 **Surface rust has formed or is forming**. Strand and anchor sockets show no signs of distress.

Feasible actions: 1) DN  
2) Clean & paint

Condition State 3 **Surface pitting may be present but any section loss is incidental** and does not affect the strength or serviceability of either the element or the bridge. **Cable banding, if any, may show some loosening or slipping. Cable anchor devices may be loosening.**

Feasible actions: 1) DN  
2) Clean & paint

Condition State 4 Corrosion is advanced. **Cable strands or wires may be broken or severely abraded. Anchors may show signs of slippage. Section loss or other deterioration is sufficient to warrant analysis** for strength and/or serviceability of both the element and the bridge.

Feasible actions: 1) DN  
2) Rehab unit  
3) Replace unit

**Units: Each**

This element defines only those steel cables not embedded in concrete. Report the number of individual cables in each of Condition States 2 through 4. The number of cables in Condition State 1 will be the total number of cables on the bridge less those reported in Condition States 2 through 4.

CDOT SUGGESTED CONDITION STATES FOR CORROSION ON PAINTED STEEL ELEMENTS		
	Description	CS
Light	Slight peeling of the paint, pitting, or surface rust, etc. No measurable section loss	2
R1	Peeling of the paint, pitting, surface rust, etc. No measurable section loss	3
R2	Flaking, minor section loss ( $\leq 10\%$ thickness loss)	4
R3	Flaking, swelling, mod. section loss ( $10\% < \text{thickness loss} \leq 30\%$ ) <b>structural analysis is not warranted.</b>	4
R3	Flaking, swelling, mod. section loss ( $10\% < \text{thickness loss} \leq 30\%$ ) <b>structural analysis is warranted due to location of corrosion on the member.</b>	5
R4	Heavy section loss ( $> 30\%$ thickness loss), may have holes through base metal	5

Condition State 1 There is little or no evidence of active corrosion. Protective coating is sound and functioning as intended to protect the metal surface. Strand and anchor sockets show no signs of distress.

Feasible actions: 1) DN

Condition State 2 There is **little or no evidence of active corrosion**. Surface or freckled rust has formed or is forming. The **protective coating may be peeling, chalking, curling**, or showing other early evidence of distress but there is **no exposure of metal**. Stand and anchor sockets show no signs of distress.

Feasible actions: 1) DN

2) Clean and restore coating

Condition State 3 **Surface or freckled rust is prevalent**. There **may be exposed metal** but there is **no active corrosion** which is **causing loss of section**. **Protective system is no longer effective**. Strand and anchor sockets show no signs of distress.

Feasible actions: 1) DN

2) Clean and restore coating

Condition State 4 **Corrosion may be present** but any **section loss is incidental** and does not affect the strength or serviceability of either the element or the bridge. **Cable banding**, if any, **may show some loosening or slippage**. **Cable anchor devices may be loosening**.

Feasible actions: 1) DN

2) Rehab unit and replace coating system

3) Replace unit

Condition State 5 **Corrosion is advanced**. **Cable strands or wires may be broken or severely abraded**. **Anchors may show signs of slippage**. **Section loss or other deterioration is sufficient to warrant analysis** for strength and/or serviceability of both the element and the bridge.

Feasible actions: 1) DN

2) Rehab unit and replace coating system

3) Replace unit

Units: LF of Floor Beam

This element defines only those steel floor beams that are not painted or are constructed with weathering steel. Report the estimated lineal feet in each of Condition States 2 through 4. The number of units in Condition State 1 will be the remainder of the units after deducting those reported in Condition States 2 through 4.

CDOT SUGGESTED CONDITION STATES FOR CORROSION ON UNPAINTED STEEL ELEMENTS		
	Description	CS
R1	Pitting or surface rust, etc. No measurable section loss	2
R2	Flaking, minor section loss ( $\leq 10\%$ thickness loss)	3
R3	Flaking, swelling, mod. section loss ( $10\% < \text{thickness loss} \leq 30\%$ ) <b>structural analysis is not warranted.</b>	3
R3	Flaking, swelling, mod. section loss ( $10\% < \text{thickness loss} \leq 30\%$ ) <b>structural analysis is warranted due to location of corrosion on the member.</b>	4
R4	Heavy section loss ( $> 30\%$ thickness loss), may have holes through base metal.	4

Condition State 1 **There is little or no corrosion** of the unpainted steel. The weathering steel is coating uniformly and remains in excellent condition.

Feasible actions: 1) DN

Condition State 2 **Surface rust, surface pitting, has formed or is forming** on the unpainted steel. The weathering steel has not corroded beyond design limits. Weathering steel color is yellow orange to light brown.

Feasible actions: 1) DN  
2) Clean & paint

Condition State 3 **Steel has measurable section loss due to corrosion but does not warrant structural analysis.** Weathering steel is dark brown or black.

Feasible actions: 1) DN  
2) Clean & paint

Condition State 4 Corrosion is advanced. **Section loss is sufficient to warrant structural analysis** to ascertain the impact on the ultimate strength and/or serviceability of either the element or the bridge.

Feasible actions: 1) DN  
2) Rehab unit  
3) Replace unit

**Units: LF of Floor Beam**

This element defines only those steel floor beams that are painted. Report the estimated lineal feet in each of Condition States 2 through 5. The number of units in Condition State 1 will be the remainder of the units after deducting those reported in Condition States 2 through 5.

CDOT SUGGESTED CONDITION STATES FOR CORROSION ON PAINTED STEEL ELEMENTS		
	Description	CS
Light	Slight peeling of the paint, pitting, or surface rust, etc. No measurable section loss	2
R1	Peeling of the paint, pitting, surface rust, etc. No measurable section loss	3
R2	Flaking, minor section loss ( $\leq 10\%$ thickness loss)	4
R3	Flaking, swelling, mod. section loss ( $10\% < \text{thickness loss} \leq 30\%$ ) <b>structural analysis is not warranted.</b>	4
R3	Flaking, swelling, mod. section loss ( $10\% < \text{thickness loss} \leq 30\%$ ) <b>structural analysis is warranted due to location of corrosion on the member.</b>	5
R4	Heavy section loss ( $> 30\%$ thickness loss), may have holes through base metal	5

Condition State 1 There is no evidence of active corrosion and the paint system is sound and functioning as intended to protect the metal surface.

- Feasible actions: 1) DN  
2) Surface clean

Condition State 2 **There is little or no active corrosion.** Surface or freckled rust has formed or is forming. The paint system may be chalking, peeling, curling or showing other early evidence of paint system distress but **there is no exposure of metal.**

- Feasible actions: 1) DN  
2) Surface clean  
3) Surface clean & restore top coat

Condition State 3 **Surface or freckled rust is prevalent.** The paint system is no longer effective. **There may be exposed metal** but there is no active corrosion which is causing loss of section.

- Feasible actions: 1) DN  
2) Spot blast, clean & paint

Condition State 4 The **paint system has failed.** **Surface pitting may be present** but any section loss due to active corrosion does not yet warrant structural analysis of either the element or the bridge.

- Feasible actions: 1) DN  
2) Spot blast, clean & paint  
3) Replace paint system

Condition State 5 **Corrosion has caused section loss and is sufficient to warrant structural analysis** to ascertain the impact on the ultimate strength and/or serviceability of either the element or the bridge.

- Feasible actions: 1) DN  
2) Major rehab unit  
3) Replace unit



Units: LF of Floor Beam

This element defines only those floor beams constructed of prestressed concrete. Report the estimated lineal feet in each of Condition States 2 through 4 for each floor beam. The number of units in Condition State 1 will be the remainder of the units after deducting those reported in Condition States 2 through 4.

CDOT SUGGESTED CONDITION STATES FOR CRACKS IN PRESTRESSED CONCRETE GIRDERS			
CS1	CS2	CS3	CS4
$\leq 0.10$ mm ( $\leq 0.004$ in)	$0.10 < W \leq 0.25$ (0.004 in)(0.009 in)	$0.25 < W \leq 0.76$ (0.009 in) (0.030 in)	$W > 0.76$ mm ( $> 0.030$ in)

Condition State 1 The element **show no deterioration**. There **may be discoloration, efflorescence, and/or superficial cracking** but without effect on strength and/or serviceability.

Feasible actions: 1) DN

Condition State 2 **Minor cracks and spalls** may be present and there **may be exposed reinforcing with no evidence of corrosion**. There is no exposure of the prestress system.

Feasible actions: 1) DN  
2) Seal cracks minor patch

Condition State 3 Some **delaminations and/or spalls may be present**. There may be **minor exposure but no deterioration of the prestress system**. **Corrosion of non-prestressed reinforcement may be present** but loss of section is incidental and does not significantly affect the strength and/or serviceability of either the element or the bridge.

Feasible actions: 1) DN  
2) Clean steel & patch, (&/or seal)

Condition State 4 **Delaminations, spalls and corrosion on non-prestressed reinforcement are prevalent**. There may also be **exposure and deterioration of the prestress system** (manifested by **loss of bond, broken strands or wire, failed anchorages, etc**). There is sufficient concern to warrant an analysis to ascertain the impact on the strength and/or serviceability of either the element or the bridge.

Feasible actions: 1) DN  
2) Rehab unit  
3) Replace unit

Units: LF of Floor Beam

This element defines only those floor beams constructed of reinforced concrete. Report the estimated lineal feet in each of Condition States 2 through 4. The number of units in Condition State 1 will be the remainder of the units after deducting those reported in Condition States 2 through 4.

SUGGESTED CONDITION STATES FOR CRACKS IN MILDLY REINFORCED CONCRETE GIRDERS						
WIDTH (W) in millimeters (inches)						
TYPE OF CRACK	NONE	$\leq 0.8$ mm ( $\leq 1/32$ in)	$0.8 < W \leq 2$ ( $1/32$ )( $1/16$ )	$2 < W \leq 2.5$ ( $1/16$ )( $3/32$ )	$2.5 < W \leq 3$ ( $3/32$ )( $1/8$ )	$W > 3$ mm ( $> 1/8$ in)
SHEAR	1	2	2	3	4	4
FLEXURE	1	1	2	3	4	4
DIAGONAL	1	2	2	3	3	4

Condition State 1 The element shows no deterioration. There **may be discoloration, efflorescence, and/or superficial cracking** but without effect on strength and/or serviceability.

Feasible actions: 1) DN

Condition State 2 **Minor cracks & spalls may be present** but there is **no exposed reinforcing or surface evidence of rebar corrosion**.

Feasible actions: 1) DN  
2) Seal cracks minor patch

Condition State 3 **Some delaminations and/or spalls may be present** and **some reinforcing may be exposed**. **Corrosion of rebar may be present but loss of section is incidental** and does not significantly affect the strength and/or serviceability of either the element or the bridge.

Feasible actions: 1) DN  
2) Clean rebar & patch, (and/or seal)

Condition State 4 Advanced deterioration. **Corrosion of reinforcement and/or loss of concrete section is sufficient to warrant analysis** to ascertain the impact on the strength and/or serviceability of either the element or the bridge.

Feasible actions: 1) DN  
2) Rehab unit  
3) Replace unit

Units: LF of Floor Beam

This element defines only those floor beams of timber construction. Report the number of floor beams in each of Condition States 2 through 4. The number of units in Condition State 1 will be the remainder of the units after deducting those reported in Condition States 2 through 4.

CDOT SUGGESTED CONDITION STATES FOR TIMBER GIRDERS, STRINGERS, CAPS AND FLOORBEAMS		
Splits < 3 ft long or checks > 1" deep = CS 2	Splits ≥ 3 ft long = CS 4	Any stress related full width crack (thickness of the section) = CS 4

Condition State 1 Investigation indicates **no decay**. There may be **superficial cracks, splits and checks** having no effect on strength or serviceability.

Feasible actions: 1) DN

Condition State 2 **Decay, insect infestation/marine borer infestation, abrasion, splitting, cracking, checking or crushing may exist** but none is sufficiently advanced to affect serviceability of the element.

Feasible actions: 1) DN  
2) Rehab &/or protect unit

Condition State 3 **Decay, insect infestation, abrasion, splitting, cracking or crushing** has produced **loss of strength of the element but not of a sufficient magnitude** to affect the serviceability of the bridge.

Feasible actions: 1) DN  
2) Rehab unit  
3) Replace unit

Condition State 4 Advanced deterioration. **Decay, insect infestation, abrasion, splits, cracks or crushing** has produced **loss of strength** that affects their serviceability of the bridge.

Feasible actions: 1) DN  
2) Rehab unit  
3) Replace unit

**Units: Each Pin & Hanger Set**

This element defines only those steel pin and hanger assemblies that are either not painted or are constructed of weathering steel.

Report the number of pin and hanger sets in Condition States 2 through 4. The number of pin and hanger sets in Condition State 1 will be the total number of pin and hanger sets in the bridge less those reported in Condition States 2 through 4.

Note: Any deformation or restriction of the pin and hanger should be identified with an on/off flag. A uniform flag number should be identified for consistent use by all states.

CDOT SUGGESTED CONDITION STATES FOR CORROSION ON UNPAINTED STEEL ELEMENTS		
	Description	CS
R1	Pitting or surface rust, etc. No measurable section loss	2
R2	Flaking, minor section loss ( $\leq 10\%$ thickness loss)	3
R3	Flaking, swelling, mod. section loss ( $10\% < \text{thickness loss} \leq 30\%$ ) <b>structural analysis is not warranted.</b>	3
R3	Flaking, swelling, mod. section loss ( $10\% < \text{thickness loss} \leq 30\%$ ) <b>structural analysis is warranted due to location of corrosion on the member.</b>	4
R4	Heavy section loss ( $> 30\%$ thickness loss), may have holes through base metal.	4

**CDOT Note: Use this element for all pin connections.**

Condition State 1 **There is little or no corrosion** of the unpainted steel. The weathering steel is coating uniformly and remains in excellent condition.

Feasible actions: 1) DN

Condition State 2 **Surface rust, surface pitting, has formed or is forming** on the unpainted steel. The weathering steel has not corroded beyond design limits.

Feasible actions: 1) DN  
2) Clean & paint

Condition State 3 **Steel has measurable section loss due to corrosion but does not warrant structural analysis.**

Feasible actions: 1) DN  
2) Clean & paint

Condition State 4 Corrosion is advanced. **Section loss is sufficient to warrant structural analysis** to ascertain the impact on the ultimate strength and/or serviceability of either the element or the bridge.

Feasible actions: 1) DN  
2) Rehab unit  
3) Replace unit

**Units: Each Pin & Hanger Set**

This element defines only those pin and hanger assemblies that are painted.

Report the number of pin and hanger sets in Condition States 2 through 5. The number of pin and hanger sets in Condition State 1 will be the total number of pin and hanger sets in the bridge less those reported in Condition States 2 through 5.

Note: Any deformation or restriction of the pin and hanger should be identified with an on/off flag. A uniform flag number should be identified for consistent use by all states.

CDOT SUGGESTED CONDITION STATES FOR CORROSION ON PAINTED STEEL ELEMENTS		
	Description	CS
Light	Slight peeling of the paint, pitting, or surface rust, etc. No measurable section loss	2
R1	Peeling of the paint, pitting, surface rust, etc. No measurable section loss	3
R2	Flaking, minor section loss ( $\leq 10\%$ thickness loss)	4
R3	Flaking, swelling, mod. section loss ( $10\% < \text{thickness loss} \leq 30\%$ ) <b>structural analysis is not warranted.</b>	4
R3	Flaking, swelling, mod. section loss ( $10\% < \text{thickness loss} \leq 30\%$ ) <b>structural analysis is warranted due to location of corrosion on the member.</b>	5
R4	Heavy section loss ( $> 30\%$ thickness loss), may have holes through base metal	5

**CDOT Note: Use this element for all pin connections.**

Condition State 1 There is no evidence of active corrosion and the paint system is sound and functioning as intended to protect the metal surface.

Feasible actions: 1) DN

Condition State 2 **There is little or no active corrosion.** Surface or freckled rust has formed or is forming. The paint system may be chalking, peeling, curling or showing other early evidence of paint system distress but **there is no exposure of metal.**

Feasible actions: 1) DN  
2) Surface clean

Condition State 3 **Surface or freckled rust is prevalent.** The paint system is no longer effective. **There may be exposed metal** but there is no loss of section.

Feasible actions: 1) DN  
2) Spot blast, clean & paint

Condition State 4 The **paint system has failed.** **Surface pitting may be present** but any section loss due to active corrosion does not yet warrant structural analysis of either the element or the bridge.

Feasible actions: 1) DN  
2) Spot blast, clean & paint  
3) Replace paint system

Condition State 5 Corrosion is advanced. **Section loss is sufficient to warrant structural analysis** to ascertain the impact on the ultimate strength and/or serviceability of either the element or the bridge.

Feasible actions: 1) DN  
2) Major rehab unit  
3) Replace unit

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